The AK-based Russian "SAIGA-12" combat shotguns

The 1970s are considered to be Golden Age of Soviet Defense Industry. The number of personnel in the defense sector of the national economy was estimated as many as 4,800,000 people to compare to 3,350,000 in the U.S.A., 700,000 in UK and 290,000 in the Federal Republic of Germany. Izhmash's* military sector operated at full steam and turned out more than 500,000 "Kalashnikov" assault rifles of various types per annum.
The early 1980-s saw a precarious economic imbalance between the civilian and military sectors, with the scales heavily tilted toward military production. In Izhevsk** alone, about 80 percent of industries had defense orientation.
In the late 1980s, however, due to the ongoing liberalization and democratization of Russian society, the "military industrial machine" began to reveal its first symptoms of malady.
The first really serious blow on the defense industry came in 1988 when the Soviet Government declared its decision to cut the defense budget by 14 percent and military production by 19.5 percent during the years 1989 and 1990. Further developments that took place in the International arena only aggravated the situation.
After the collapse of the Soviet Union in 1992, and as a result of disintegration of the Warsaw Pact, Izhmash faced a serious problem in small arms sales.
Izhmash's leading specialists in cooperation with the Arms Design Center outlined the principles of conversion - the strategy of transferring a part of the company's military production potential into civilian.
In fact, Izhmash's model of conversion was based, for the main part, on preserving the existing productional potential and adapting it to manufacture of para-military and sporterized firearms, to be developed on the basis of AK and SVD.

In 1993 the factory developed the SAIGA rifle chambered for the 7.62 x 39 mm round. It turned out a promising experiment. This encouraged IZHMASH to create novel smooth-bored auto-loading shotguns. Company's gun specialists decided to develop a shotgun which would require the least number of changes: in gauge .410. Frankly speaking, we did not expect that this weapon would become so popular. Statistically, the guns in this specific gauge make only 5 to 7 percent of the world's firearms market share. However, the SAIGA-410 short version with the folding stock sold very well, the main market segment being various security agencies (banks, offices, etc.)
What was important, people at IZHMASH were able to understand, the way out of the situation was found! We moved in two directions: more new rifles and more new shotguns. IZHMASH made improved rifles chambered for the 5.6x39 and .308 cartridges and a shotgun in ga. 20.
Then there was the war: in the Central Asia, the North Caucasus and

Moldavia.

(*) The IZHMASH Open Joint Stock Co. is Russia's largest arsenal home of the AK family of small arms. Founded in 1807.
(**) Izhevsk, the city with population of 730,000 people, is located in Western Urals 1,200 kilometers east of Moscow.
Numerous attacks of terrorists on the civilian population made us realize, the SPECOPS may need a shotgun to be used in the changing type of tactical operations:
(a) short/close ranges, mobile actions in cities with high concentration of human population;
(b) mobile patrols for the purpose of creating a screen around such places where surgical/policing operations were under way.
Application of issue army automatic weapons (AKMS or AKS74U, for example) resulted in numerous and unwanted "side effects" - casualties among citizens.
The facts were telling us, a combat shotgun based on the AK system would be just perfect. Why the AK system? The considerations were as follows:

1. The degree of parts commonality would make maintenance and repairs easier from the point of view of the stock of spare parts.
2. Training of shooters who are familiar with the AK weapons was easier and more effective thanks to constructional similarity.

One of such weapons is a smooth-bored shotgun in gauge 12 and designated the "Saiga-12". The shotgun is available in three main configurations:
(1) "Standard" - with the 580 mm long barrel and a non-folding buttstock;
(2) "Standard Folding" with the barrel 580 mm long and a folding stock;
(3) "Short" with the barrel 430 mm long, with the folding buttstock derived from the AK74M.
To special orders, the factory makes barrels 330 and 680 mm long.
Barrels of the "Saiga-12" are made either cylindrical or with the full choke of 1.0 mm.
Cylindrical barrels may be optionally equipped with various muzzle devises, such as: "paradox", half-choke or full choke. The gun accepts all brands and types of ammunition in ga. 12.
Two of the three available modifications of said shotgun - Saiga-12C and Saiga-12K - have been constructed as service weapons.

As seen from the transparencies, there is a significant resemblance between the "Saiga-12" and the AK rifles: Top (bolt) cover, fire-mode selector, buttstock, pistol grip are identical.
Although the receiver looks very much the same, it has been considerably modified.
On the whole, 65 % of components of the SAIGA-12 shotguns are derived from

the AK47 construction.
For the purpose of retaining original size of receiver, on the one hand, and a necessity of providing room for a large bolt, on the other hand designers came to an original solution - the upper location of internal bolt carrier's guiding rail was changed. In the "Saiga-12" shotguns the rail is located at the receiver's bottom.
As for the bolt carrier and trigger mechanism, there are several important alterations too. First, a portion of the right side of the rod which connects bolt carrier with piston is milled off at an angle to ensure trouble-free operation of the mechanism of extraction of a larger shell.

To match the size of shells, the ejection opening in the right side of the top cover above receiver is also made larger. A stamped steel-sheet sliding shutter has been provided on the guiding rod of a return spring to prevent excessive penetration of dust and other unwanted foreign particles into receiver. Due to application of heavy-duty types of cartridges and for the purpose of enhancing proper locking of the top (bolt) cover to the receiver, the protruding base lug of the return mechanism, which also functions as a retainer of the top cover, has been provided with an additional knob. Thus, to remove the top cover proceed as follows: depress the knob and, holding it in such a position, push the extending locking lug inside the cover - the cover easily comes out from its recess. In contrast to the original AK assault rifle, "Saiga-12" has a gas regulator which could be placed in either position "1" or position "2" depending on the type of ammunition - standard 70 mm or "Magnum" 76 mm shells. The weapon operates with both types of ammo.
The additional locking knob and the gas regulator have been made due to the following considerations. It has become a standard in the Russian small arms design school, that the speed of recoil of bolt carrier should be 4 m/sec. Such speed enables stability of reloading without the need for a gas regulator. In the "Saiga-12" shotgun due to usage of heavy-duty ammunition, the speed of recoil of the bolt carrier is substantially greater. With the gas regulator the recoil speed is reduced to a safe level. Further research on the gas engine of the "Saiga-12" resulted in creating a system which functions with 70 and 76mm-long shells without changing the position of gas regulator. So in reality the regulator is required when it comes to utilization of high velocity loads.
More alterations were made in the trigger mechanism of the "Saiga-12" by eliminating an auto-sear. Hence, the selector functions only in two modes. The upper position marked "S" is safety and the lower position marked "F" is fire.
A considerable advantage of the construction of the "Saiga-12" universal magazines is in their versatility in regard to the size of shells. Conventional pump-actions are sensitive to the cartridges of different lengths. Different length of the shells loaded into a horizontal magazine

in a "head-to-tail" manner means irregularity of feeding stroke which invariably may lead to jamming. The "Saiga-12" vertical single column magazine enables the capability of using ammunition of the two sizes in a random combination. Capacity of black glassfiber-reinforced polyamide magazines is "Standard" 5 rounds or "Special" 7 rounds. For experimental purposes the factory devised and manufactured welded sheet-metal magazines which hold 10 rounds.

Table 1. KINETIC PARAMETERS OF SAIGA-12

| Length of barrel | Size of shell | Shot load | V10 E10 |
|---|---|---|---|
| 580 mm | 12/70 | 33 g | 311 m/sec 1,600 J |
| 580 mm | 12/73 | 53 g | 302 m/sec 2,500 J |
| 430 mm | 12/70 | 33 g | 290 m/sec 1,500 J |
| 430 mm | 12/73 | 53 g | 280 m/sec 2,300 J |

As seen from the above diagram, decreasing the length of barrel by 26 %, the velocity loss is only 6.75 %, while the energy loss equals 6.25 % (shell size 12/70). Corresponding loss of values of the above parameters in the case of 12/73 mm shells equals 7.28 % and 8.0 %.
Taking into account greater ergonomic comfort of the weapon with the shorter barrel, its portability, the "Saiga-12K" with the barrel 430 mm long makes a better fighting shotgun than the "Saiga-12" with non-folding buttstock.

At this point let us consider such a parameter as the psychological effect of the weapon.
Most assignments for the development of new police type weapons require that the weapon should be (1) in semi-auto only and (2) must not have an aggressive appearance.
We at IZHMASH agree that a fully automatic shotgun is nonsense. However, in our opinion, a special-purpose fighting shotgun must, on the contrary, look mean and aggressive. The statistics that we have shows that an aggressively looking weapon in many cases helps avoid critical development of a conflict situation.
In several real-life cases, the impressive appearance of the "Saiga-12K" shotgun prevented critical progress of a conflict and made usage of the weapon for effect unnecessary.

One criminal, when asked why he preferred to give up rather than resist and fight the police, confessed that the "Kalashnikov"- looking weapon with a horrible-size muzzle was more than a convincing argument.

Table 2.

ACCURACY POTENTIAL OF THE SAIGA-12
(ambient temperature - 34?C; side wind velocity: 2.5 m/sec.; range: 35 m )

| Length of shell | Shot size | Hit probability | |
|---|---|---|---|
| | | full choke | cylinder |
| 76 mm | Buck Shot | 100 % | 92 % |
| 70 mm | AAA | 73 % | 53 % |
| 70 mm | 1 | 70 % | 42 % |
| 70 mm | 3 | 69 % | 42 % |
| 70 mm | 5 | 67 % | 41 % |
| 70 mm | 6 | 65 % | 40 % |

Table 3.

SPECIFICATIONS OF THE "SAIGA-12" SHOTGUNS

| Modification: | Saiga-12 | Saiga-12C | Saiga-12K |
|---|---|---|---|
| Weight, empty and without magazine, kg | 3,8 | 3,6 | 3,5 |
| Overall length, ÍÍ *) | 1145 | 1060 | 910 |

| | | | |
|---|---|---|---|
| Length, with buttstock folded, mm | - | 820 | 670 |
| Length, with detachable pistol grip, mm | 930 | - | - |
| Length of barrel, ÍÍ | 580/680 | 580/680 | 430 |
| Magazine capacity, rds | 5 & 7 | 5 & 7 | 5 & 7 |
| Weight of magazine, empty, kg: | | | |
| - 5-rd version: | 0.175 | - | - |
| - 7-rd version: | 0.235 | - | - |
| Length of magazine, mm: | | | |
| - 5-rd version: | 165 | - | - |
| - 7-rd version: | 229 | - | - |
| Optimal range of fire, Í: | | | |
| - shot | 35 - 70 | 35 - 70 | 35 - 70 |
| - slug | 50 - 100 | 50 - 100 | 50 - 100 |
| Sights: | The front sight consisting of a brass bead and the rear sight of an open U-notch type are attached to a serrated rib. By turning the screw with a miniature flywheel the front sights can be adjusted for elevation zero. The rear open U-notch type sight is adjustable for windage zero. | | |
| Finish: | Black phosphate, with lacquer coating | | |
| Furniture: | Black fiberglass-reinforced polyamide handguard, pistol grip and buttstock. | | |
| Accessories: | Sling, carrying pouch, cleaning kit included. | | |

Optical sights and
night-vision devices - optional.

---

---

Note: Overal length of the "Saiga-12" and "Saiga-12C" weapons with 680 mm long barrels equals 1,245 and 1,160 mm respectively.

STANDARD OPERATIONAL PROCEDURES

All modification of "Saiga-12" have the following operational procedures. The operator should shift the selector into the lower position marked "F" to bring the weapon into firing mode. By pulling the extending side handle of the
bolt carrier all the way back, the hammer is cocked and retained by the sear. Driven back to its initial position by the return spring, the bolt strips the first round from the magazine and rams it further into chamber. Turning on its axis, the bolt comes with its two lugs into recesses in the barrel extension and locks the barrel. The weapon is ready to fire. To deliver a shot, pull the trigger. The trigger extension pushes the sear and releases the hammer. The hammer, driven by the multiple-strand steel-wire main spring pivots on its axis and hits the striker. After a shot is fired, a portion of combustion gas escapes from the barrel into gas chamber through the opening in the barrel side. The piston receives an impulse and pushes the bolt carrier towards rear until pressure drops to a safe level. The slot on the inner side of receiver turns the bolt to the right, the bolt releasing its two locking lugs from recesses in the barrel block. The bolt carrier travels on, the empty shell is extracted and then ejected from the receiver. While the bolt group keeps on moving, the single-strand steel-wire return spring is compressed generating a return impulse. The hammer once again rolls down and engages with the sear. As soon as the carrier slams the rear wall of the receiver, driven by the return spring, the bolt carrier commences its forward motion. The whole cycle is repeated. All these procedures happen in a fraction of a second.
As it was mentioned above, the trigger mechanism of "Saiga-12" is a replica of that of the AK original assault rifle with the difference that the autosear has been removed from its construction. At all times the gun is capable of delivering single shots only, while reloading is done automatically. Each time an operator wants to shoot the next round, the trigger should be released and depressed until the magazines runs out of ammunition.

On the whole, the "Saiga-12" semiautomatic shotguns feature good reliability and simplicity of operation of the well-proven and extensively fielded AK system.

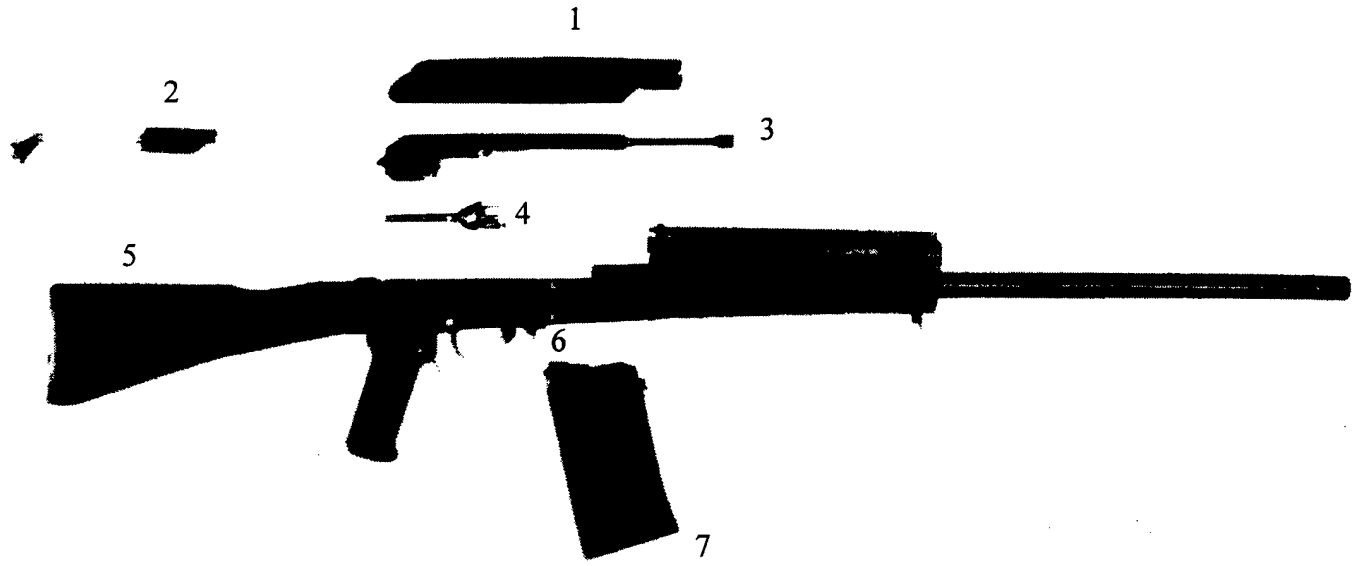


Fig. 1. SAIGA-12C, field stripped:
1. Top bolt cover.
2. Return mechanism.
3. Bolt carrier with piston.
4. Bolt.
5. AK-type folding buttstock.
6. Safety lever.
7. Box-type detachable 5-rd magazine.

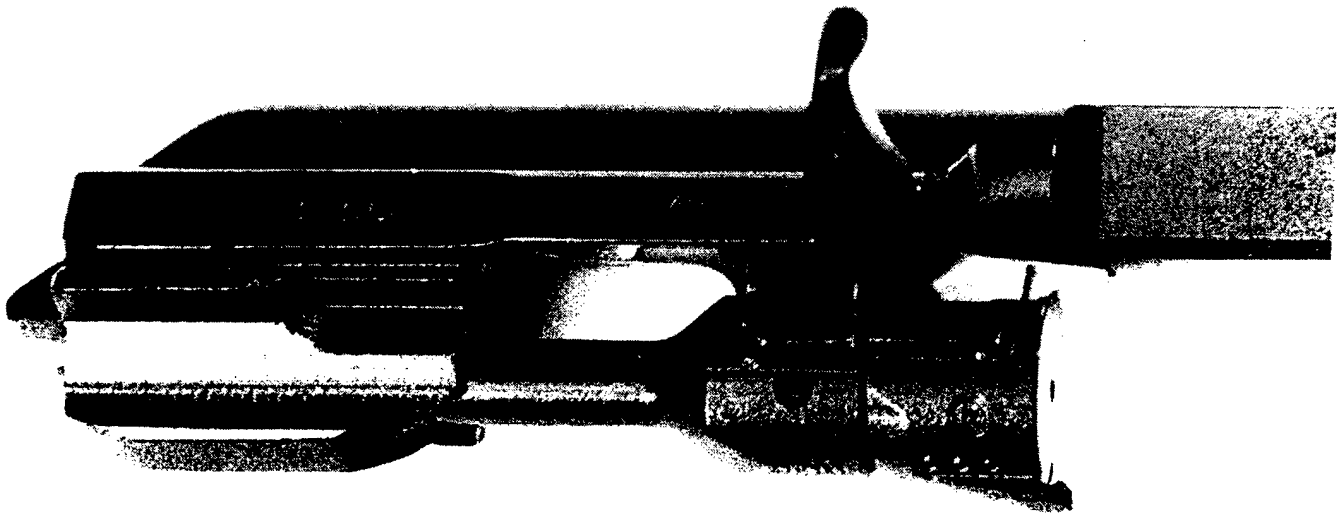

Fig. 2. Bolt carrier with bolt. Bolt carrier's extension is milled off at an angle to allow trouble-free ejection of empty shells.

# THE SAIGA-12 SERIES COMBAT SHOTGUNS

Fig. 1. SAIGA-12, with non-folding buttstock, 580-mm long barrel.

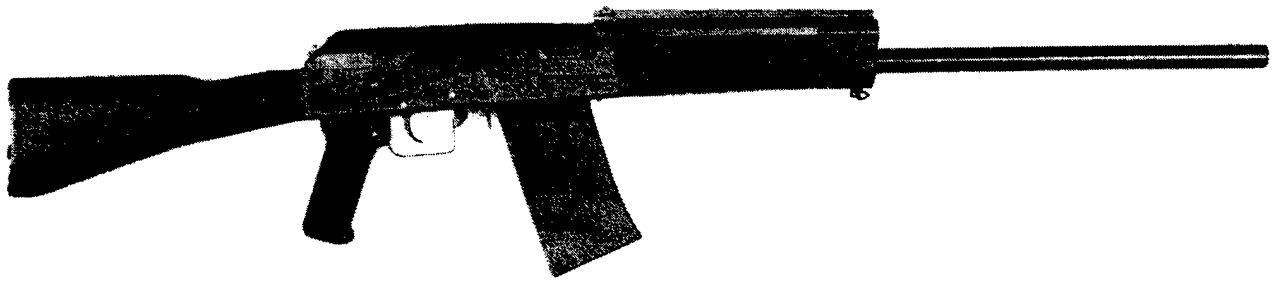

Fig. 2. SAIGA-12C, with folding buttstock, pistol grip and 580-mm long barrel.

Fig. 3. SAIGA-12K, with folding buttstock, pistol grip and 430-mm long barrel.

Fig. 4. SAIGA-12, with quickly detachable pistol grip.

## KINETIC PARAMETERS OF SAIGA-12

| Length of barrel | Size of shell | Shot load | $V_{10}$ | $E_{10}$ |
|---|---|---|---|---|
| 580 mm | 12/70 | 33 g | 311 m/sec | 1,600 J |
| 580 mm | 12/73 | 53 g | 302 m/sec | 2,500 J |
| 430 mm | 12/70 | 33 g | 290 m/sec | 1,500 J |
| 430 mm | 12/73 | 53 g | 280 m/sec | 2,300 J |

## ACCURACY POTENTIAL OF THE SAIGA-12 SHOTGUNS

*(ambient temperature - 34°C; side wind velocity: 2.5 m/sec.; range: 35 m )*

| Length of shell | Shot size | Hit probability | |
|---|---|---|---|
| | | full choke | cylinder |
| 76 mm | Buck Shot | 100 % | 92 % |
| 70 mm | AAA | 73 % | 53 % |
| 70 mm | 1 | 70 % | 42 % |
| 70 mm | 3 | 69 % | 42 % |
| 70 mm | 5 | 67 % | 41 % |
| 70 mm | 6 | 65 % | 40 % |

## SPECIFICATIONS OF THE "SAIGA-12" SHOTGUNS

| Modification: | Saiga-12 | Saiga-12C | Saiga-12K |
|---|---|---|---|
| Weight, empty and without magazine, kg | 3,8 | 3,6 | 3,5 |
| Overall length, мм *) | 1,145 | 1,060 | 910 |
| Length, with buttstock folded, mm | - | 820 | 670 |
| Length, with detachable pistol grip, mm | 930 | - | - |
| Length of barrel, мм | 580 or 680 | 580 or 680 | 430 |
| Magazine capacity, rds | 5 & 7 | 5 & 7 | 5 & 7 |
| Weight of magazine, empty, kg: | | | |
| - 5-rd version: | 0.175 | - | - |
| - 7-rd version: | 0.235 | - | - |
| Length of magazine, mm: | | | |
| - 5-rd version: | 165 | - | - |
| - 7-rd version: | 229 | - | - |
| Optimal range of fire, м: | | | |
| - shot | 35 - 70 | 35 - 70 | 35 - 70 |
| - slug | 50 - 100 | 50 - 100 | 50 - 100 |